THESIS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

THE LIVED EXPERIENCE OF ACADEMIC ENTREPRENEURSHIP

The interplay between practice, identity, and context

MAROUANE BOUSFIHA

Division of Entrepreneurship and Strategy
Department of Technology Management and Economics

CHALMERS UNIVERSITY OF TECHNOLOGY

Gothenburg, Sweden 2020

THE LIVED EXPERIENCE OF ACADEMIC ENTREPRENEURSHIP
The interplay between practice, identity, and context
MAROUANE. BOUSFIHA
ISBN: 978-91-7905-306-2

Doktorsavhandlingar vid Chalmers tekniska högskola
Ny serie nr 4773
ISSN ISSN 0346-718X

Division of Entrepreneurship and Strategy
Department of Technology Management and Economics
Chalmers University of Technology
SE-412 96 Gothenburg
Sweden
Telephone + 46 (0)31-772 1000

Printed by Chalmers Reproservice
Gothenburg, Sweden 2020

THE LIVED EXPERIENCE OF ACADEMIC ENTREPRENEURSHIP

The interplay between practice, identity, and context

Marouane Bousfiha
Department of Technology Management and Economics
Chalmers University of Technology

Abstract

This thesis explores how academic entrepreneurs experience and practically manage the combination of research and business, with special emphasis on the interplay between practice and identity and the effects of institutional context. Empirical focus is on university researchers who co-found companies while remaining in academia. Despite being the topic of intense scholarly attention, research on academic entrepreneurship is lacking a richer understanding of the actor at the center of it all: the university scientist engaging in entrepreneurship. The overwhelming dominance of macrolevel research (e.g. organizational and institutional determinants, and economic outcomes) has led to calls for more research into the microlevel processes that underpin this phenomenon. However, scholars taking such a microlevel approach have primarily focused on how characteristics of individual scientists, such as age, gender, academic seniority and scientific productivity, relate to their propensity to engage in research commercialization. While useful, a preoccupation with individuals' characteristics not only neglects the agency and introspection of scientists engaging in entrepreneurship, it also misses a great opportunity to enrich and deepen our understanding of institutions, norms and university policies by not examining them through the lens of academic entrepreneurs' lived experiences and identity work.

To enrich and complement our understanding of academic entrepreneurship, this thesis takes as point of departure the lived experience of university scientists engaged in venture creation. The transitions between the distinct roles of academic and entrepreneur can lead to unforeseen and irregular experiences that disrupt the sense of normality and place new, sometimes conflicting, demands on work identity. By exploring the work practices academic entrepreneurs engage in as they combine their two distinct roles, the aim is to understand how these individuals make sense and hybridize their identities as scientists and academics. To do so, this thesis relies primarily on qualitative studies that explore the contextualized lived experiences of academic entrepreneurs with special emphasis on the confluence, complementarities and potential tensions between their roles. The primary method is semi-structured phenomenological interviews.

Findings indicate that academic entrepreneurs are not simply adopting a ready-made identity that lies implicit in institutional norms or can be taken over from exemplary foregoers. Instead, they engage reflexively in subtle transformations and revisions of their own existing work identity, which is typically that of an academic. The thesis shows how practice can be an occasion for nuancing work identity. It contributes to the academic entrepreneurship literature by highlighting how clarity and coherence in work identity is achieved through cultivating a reinforcing dialectic between opposing roles, instead of only separating them through defensive boundaries.

Keywords: Self and identity, identity work, academic entrepreneurship, context, practice, role-transitions, phenomenology, university-industry relationships, grounded theory.

Acknowledgements

I would like to warmly thank my supervisor Henrik Berglund for being such an inspiring mentor. Thank you for taking me on as a PhD student and believing in me. Your guidance, constant support and constructive advice have been invaluable during this journey. It was an absolute pleasure working with you.

I am also grateful to my co-supervisors Tomas Hellström and Karen Williams-Middleton for their encouragements and precious feedback. Thank you for being available whenever I needed support.

To all of my awesome colleagues and friends at Chalmers and beyond, none mentioned, none forgotten; It's been a delight getting to know you. I will forever be thankful for the laughter and the endless conversations. I feel lucky and privileged to have had you around.

My family, thank you for your unconditional support.

Emelie, thank you for making my life happier!

Marouane
Göteborg, April 2020.

List of appended papers

This thesis is based on the following papers which will be referred to in the text by roman numerals.

I. **Bousfiha, M**. and Berglund, H. *Constructing a Hybrid Identity: The Case Of Academic Entrepreneurs*. Presented at AoM in Boston, 2019.
(Under development, Targeting *Research Policy)*

II. **Bousfiha, M**. *The Lived Experience of Academic Entrepreneurship: A Comparative Case Study of Chalmers and Stanford*.
(Under development, Targeting *Research Policy*)

III. **Bousfiha, M**., Williams Middleton, K, Warren, L. *'What I Do Defines Me': Exploring Entrepreneurship as Occupational Identity*.
(Reject and Resubmit at *Entrepreneurship and Regional Development*)

IV. Berglund. H., **Bousfiha, M**., and Mansoori Y. *Opportunities as Artifacts and Entrepreneurship as Design*.
(Forthcoming, *Academy of Management Review*)

Table of Contents

1. INTRODUCTION

> *"At the university, they look at me as a hopeless practitioner and out in the industry, they see me as a theoretical lunatic. It's uncomfortable to sit in the middle, but it's not necessarily a bad thing"*
> Professor JC, Stanford

This thesis explores how academic entrepreneurs experience and practically manage the combination of research and business, with special emphasis on the interplay between *practice and identity* and the effects of *institutional context*. It aims at enriching and complementing our understanding of academic entrepreneurship by taking as point of departure the *lived experience* of university scientists engaged in venture creation.

Historically focused on research and education, the modern university is gradually reinventing itself in pursuit of societal and economic impact (Schulte, 2004; Shane 2004; Etzkowitz, 2003). This development has been further accelerated with the enactment of laws designed to stimulate the transfer of technology from university labs to the market and society at large (Aldridge and Audretsch 2011; Kenney and Patton 2009; Mowery and Sampat, 2005). Such change in the social contract between the university and society has spurred increasing interest from scholars seeking to understand the antecedents and implication of such transformation (for comprehensive reviews see Perkmann et al., 2019; Siegel and Wright, 2015; Rothaermel et al., 2007). The research conducted so far has undoubtedly generated valuable insights. However, by focusing on macrolevel and institutional accounts of the phenomenon, it has largely failed to appreciate the complexity and richness inherent in the lived experience of faculty members who enact and embody the changing institutions on the ground.

To enrich our understanding of academic entrepreneurship this thesis therefore sets out to complement existing research with insights grounded in the lived experience of faculty entrepreneurs. This approach is valuable for several reasons: First, it extends the literature on academic entrepreneurship by providing a perspective grounded in the

immediate experience of individual scientists as they balance the competing demands from their distinct roles. Second, it contributes to the literature on role transitions and identity by exploring how academic entrepreneurs bring into alignment their daily practice and work identity. Third, it generates useful insights to institutional actors (e.g. policy makers, university administrators, public funding agencies) seeking to design policies that are attuned to the life worlds and the practical realities of academic entrepreneurs.

This thesis departs from existing literature on academic entrepreneurship that has devoted more attention to institutional and contextual factors at the expense of individual-level studies that remain relatively rare (Hoy and Pries, 2009, Grimaldi et al, 2011). As a consequence, the micro-foundations of academic entrepreneurship are still not very well understood, and scholars repeatedly call for research that would deepen our understanding of the university scientist who is at the center of this process (Siegel and Wright, 2015; Balven, 2018). Existing microlevel studies tend to focus mainly on the influence of individual characteristics on the propensity of university scientists to engage in entrepreneurial behavior (e.g. Clarysse et al., 2011). While valuable, these treatments abstract away from individuals' personal experience and sense-making efforts and concentrate on identifying factors that can predict scientist's decision to commercialize.

This thesis also takes issue with the tendency in the literature to rely on a broad definition of academic entrepreneurship that incorporates patenting, licensing, consulting, collaboration with industry and venture creation. Including all these activities under the umbrella term of academic entrepreneurship might be useful for a macrolevel examination of the phenomenon. However, given my focus on how individual academics make sense of their roles and identities, it is more suitable to concentrate on the "extreme" case of company founding. Specifically, I argue that licensing a technology or writing a patent application are not likely to require the same degree and type of involvement and effort compared with starting a business. Founding and developing a venture is risky, time-consuming and requires scientists to engage in activities that place the most challenging demands on their identities. In this sense, academic entrepreneurship offers also a useful context to extend the identity literature that examines how individuals

construct work related identities during times of professional change (Ibarra and Barbulesco, 2010; Van Maanen, 2010; Pratt et al, 2006).

Identity scholars have shown that intricate bonds exist between work and identity (Pratt et al., 2006). Professionals who are confronted with role changes constantly compare what they do (practices and work activities) with their own assessment of who there are (identity) (e.g.; Caza et al., 2016; Lifshitz-Assaf, 2018). A misalignment between these two can push the individual to engage in identity adjustments as a response. The hybrid nature of the role "academic entrepreneur" and the heterogeneous expectations attached to it naturally puts the individual in situations ripe for inconsistencies between work and identity. Such inconsistencies become even more salient when academic entrepreneurs have to repeatedly transition, sometimes on a daily basis, between professionally distinct work roles. This thesis explores therefore the interplay between situated and concrete work activities and faculty's work identity; a subject that has been understudied in the existing literature.

Structure of the thesis

The thesis is structured as follows: Chapter 2 provides an overview of the theoretical landscape within which the thesis is positioned. Chapter 3 outlines the methods used in the empirical studies and chapter 4 provides a summary of the appended papers. Chapter 5 builds upon the findings of the appended papers in order to suggest elements of answer to the research question before outlining the thesis contributions in chapter 6.

2. THEORITICAL PERSPECTIVES[1]

Chapter 2 is structured as follows: First, it presents the scholarly debate about the nature and purpose of universities and the emergence of Mode 2 science. Second, it reviews the literature on academic entrepreneurship and third, it introduces relevant theoretical perspectives on identity and work.

2.1 The nature and purpose of universities

The debate about the nature and purpose of universities has a long history. Universities have been conventionally tasked with two missions- research and education. Over the recent decades, however, they have been expected to contribute to the prosperity and progress of industry, the economy and society at large (Martin, 2012). This change has generated heated debates between two opposing camps. A "pessimist" camp that perceives the introduction of the third mission as a threat to the scientific 'commons' and the pursuit of "knowledge for its own sake" (e.g Slaughter and Leslie, 1997; Slaughter and Rhoades, 2004). Scholarly work in this camp includes books such as Steal This University (2003), Universities in the Marketplace (2003), The University in a Corporate Culture (2003), and The University in Ruins (1996). All these writings have in common the concern that universities are threatened of being taken over by the ethos of commercialism. Others, however, subscribe to an "optimist" view and welcome the convergence between academia and industry (e.g. Clark 1998; Schulte, 2004; Guerrero et al, 2016; Klofsten et al., 2019). They acclaim the emergence of a new category of university scientists who are able to combine research excellence with commercialization drives and propose models connecting government, the academy and industry (e.g. Etzkowitz and Leydesdorff, 1999; 2000). At the center of this debate are individual scientists who operate within a social structure governed by traditional academic norms.

2.1.1 Academic norms

Merton's (1957) normative system has long been held as the gold standard when portraying what constitutes the ethos of academic work. The Mertonian system is built upon four pillars: (a) universalism –stipulating that scientific claims should be verifiable

[1] Parts of the reviewed literature have been used in my licentiate thesis.

independently of their protagonists, (b) communism – implying that scientific results are to be shared and not kept secret. (c) disinterestedness – meaning that scientists should work for the common good of the scientific community and not their own personal interest, and (d) organized skepticism – suggesting that careful scrutiny of scientific contributions is an obligation and that scientists must doubt their own findings as well as those of others. Although most academics aren't religiously adhering to these ideals in practice, they nevertheless have a major normative significance for the community and influence its identity (Lam 2010). Some scholars even argue that these four norms are intimately intertwined with academics' identities and are reflected in their behavior (Jain et al, 2009).

However, the Mertonian norms have come under heavy criticism over the years. In an interview-based study involving 42 of the most prestigious scientists behind the Apollo lunar missions, Mitroff (1974) suggests a set of counter-norms for science that are rather rooted in its personal character, as opposed to Merton's early work stressing the impersonal character of science (Merton 1957). Mitroff argues that the popular notion that scientists are objective and emotionally disinterested is rather naïve. He asserts that *"if science were also exclusively founded on the norms of disinterestedness, universalism and community, I doubt science could have arisen as we know it"* (1974:587). Recent scholarship has adopted the essence of Mitroff's critique by asserting that the Mertonian normative system is excessively idealized and overlooking the practical reality of scientists and their day-to-day struggle to secure funding and resources essential to their research (Lam 2010). The growth of an "entrepreneurial academic paradigm" is generating a clear convergence between academia and industry, thus increasingly challenging the behavioral prescription of the traditional Mertonian normative system. This, in turn, is proving to have some profound changes in how faculty members perceive their work identity and their career paths (Lam, 2010; Lam and de Campos, 2015). These changes can be considered one manifestation of a larger transformation in how knowledge is produced and disseminated.

2.1.2 A "new" mode of knowledge production

The change in the purpose and mission of the university can be associated with the emergence of a new knowledge production system that Gibbons et al. (1994) called Mode 2 Knowledge. The old paradigm of scientific discovery "Mode 1" - characterized by the hegemony of theoretical and experimental science; by an internal taxonomy of disciplines; and by the autonomy of scientists and their host institutions, the universities- was being supplanted by a new paradigm of knowledge production 'Mode 2', which denotes a transdisciplinary approach to scientific research driven by applications and conducted by scientists who are socially accountable for the impact of their research on society (Nowotny et al., 2003; Hessels and Van Lente, 2008). Mode 2 was warmly welcomed by politicians trying to establish a link between publicly funded research and innovation, while it was met with skepticism by those who worried that the autonomy and quality of scientific work would be imperiled if more pressure for relevance is put on university researchers.

However, a number of scholars dispute the novel character of Gibbons et al's Mode 2 knowledge and question the implicit assumption that the third mission is a new threat to the university (Martin, 2012; Kleinman, 2003). Historical evidence on the evolution of universities' social contract points to the fact that Mode 2 might have predated Mode 1. The same evidence suggests that it's a myth to assume that at some point in history scientists were free from the pressure to link their work to economic and societal needs. This perspective adds more nuance to the debate on the mission and purpose of the university by demonstrating how these have always been driven by a mixture of both pure and utilitarian ethos (Siegle and Wright, 2015).

This thesis does not take sides in this debate. While acknowledging the fundamental changes that the modern university is undergoing, its primary purpose is to explore the lived experience of faculty members who are on the very front line of these changes. These individual scientists are increasingly engaged in what has come to be known as "academic entrepreneurship" or the commercialization of science.

2.2 Entrepreneurship

Entrepreneurship has been conceptualized in multiple ways. Some scholars treat it as self-employment and try to explain what determines individuals' choice between working for a wage and being self-employed (Parker, 2004). Others provide a more functional definition of entrepreneurship and model it as an activity or a process and not just an employment category. The latter approach is rooted in economic theory and depicts entrepreneurship as innovation (Schumpeter, 1911), judgement (Knight, 1921) or alertness (Kirzner, 1973). According to this line of thought, entrepreneurship is conceptualized either as a process of discovery of profit opportunities that exist independently of the entrepreneur, or as a process of creation of market imperfections that can subsequently be turned into profit (Schumpeter 1942, Baker and Nelson 2005). While these conceptualizations are useful for understanding what happened retrospectively after an entrepreneur has achieved success, they fall short of enriching our understanding of entrepreneurial action leading up to such outcomes. Thus, recent entrepreneurship literature is beginning to shift focus from opportunity identification to entrepreneurial action and urges for a conceptualization of opportunities as being tightly connected to what entrepreneurs do (Sarasvathy 2004, 2008, Venkataraman et. 2012, Romme 2016, Dimov 2016). This thesis is positioned within this emerging body of literature. **Paper IV** proposes a conceptualization of entrepreneurship as a form of design and elaborates on how opportunities can be thought of as artifacts that iteratively develop at the interface between organized individuals and their environment (Berglund at al., forthcoming).

This conceptualization acknowledges that entrepreneurship can be exercised both inside and outside the academic domain. The act of creating and developing a venture is only one among many other possible manifestations of entrepreneurial action by academics. Since this thesis is focused on the interplay between the concrete practices and work identity of researchers who frequently transition between academia and their companies, it mainly considers entrepreneurial action in the particular case of creating and developing a venture. Therefore. this thesis does not suggest that the act of creating a company is what essentially defines entrepreneurship. Venture creation is merely an occasion where university researchers engage in a bundle of concrete activities and

practices that, if combined with typical academic work, can influence their views of who they are as professionals.

2.3 Academic entrepreneurship

Academic entrepreneurship is usually defined in the literature as *"the involvement of academic scientists and organizations in commercially relevant activities in different forms" (*Pilegaard et al, 2010, page 46). These forms include large scale science projects, contracted research, consulting, patenting/licensing, spin off firms, external teaching, sales and testing (Klofsten and Jones-Evans, 2000). Each activity implies a different level of involvement thus placing a varying set of demands on the work identity of university scientists. It is worth noting though that this thesis is focused on direct academic entrepreneurship where faculty members are personally involved in the founding and creation of research-based ventures. This is to be differentiated from indirect academic entrepreneurship where university education may lead indirectly to the establishment of start-ups by alumni and university students (Wright, 2014). The latter type falls outside of the scope of this thesis. Before going any further, let us turn our attention to the literature on academic entrepreneurship and review some of its key contributions at the institutional, university and individual levels.

2.3.1 The institutional context

For decades, significant efforts have been made to bolster the links between publicly funded research and private industry (Haeussler and Colyvas, 2010). Under the rationale of promoting innovation and intensifying knowledge flows to firms, a plethora of public initiatives emerged to stimulate and encourage faculty participation in commerce (Mowery and Sampat, 2004, Geuna and Nesta, 2006). The enactment of the Bayh- Dole act in the United States since the 1980s has resulted in a remarkable increase in academic entrepreneurship activities (Grimaldi et al., 2011). All over the world and in Europe in particular, several countries developed national policies that imitated or adapted this US model in order to spur entrepreneurial pursuits within their respective academic systems (Powell et al., 2007, Mustar and Wright, 2010; Mowery and Sampat, 2005;). The popular press and many others hailed the Bayh- Dole act as a critical piece of legislation the results

of which are "nothing less than a major boon to national economic growth" (e.g. The Economist, 2005).

However, an increasing number of critiques began to nuance this overly positive picture (Glenna et al., 2007, Nelson, 2004, Litan et al., 2007), especially given a number of complaints from faculty inventors themselves as to the promised merits of the university ownership model. Evidence suggests that the introduction of a Bayh-Dole Act type legislation has not been as beneficial to society as many expected (Siegel and Wright, 2015). Some scholars warn that the widespread efforts to emulate the US example must be cognizant of the highly contingent character of technology transfer, particularly since organizational borrowing does not always succeed in appreciating and taking into account local contingencies (Powell et al., 2007). Others took the criticism a step further by demonstrating how the university ownership model is a dysfunctional arrangement that is inferior to models vesting ownership in the inventor or immediately making all inventions publicly available (Kenny and Paton, 2009).

2.3.2 The university

Given the huge disparities between universities in terms of the rate and performance of spinoff creation, several studies set out to investigate the effect of the university's internal practices, strategies and policies for promoting academic entrepreneurship (Di Gregorio and Shane, 2003; Rasmussen and Borch, 2010; Galán-Muros et al., 2015). The bulk of this literature highlights the importance of university support mechanisms for academic entrepreneurship at multiple levels, from strategic to operational levels (Galán-Muros et al., 2015). Such support mechanisms include internal policies and procedures (Caldera and Debande, 2010, Muscio et al., 2014, 2016), a clear university strategy promoting venture creation (Lach and Schankerman, 2008, Phan and Siegel, 2006, Rasmussen and Borch, 2010, Van Looy et al., 2011), a reward and promotion system that defines the various incentives for researchers to commercialize (Siegel et al., 2003, Yencken et al., 2005), and the role of support structures such as TTOs and business incubators (e.g. Markman et al., 2005).

The influence of the department in which academic entrepreneurs are embedded can also have a meaningful effect. Within the same university, academic departments can differ considerably in their culture and attitude towards science commercialization (Grimaldi et al., 2011). Some scholars argue that developing university-level policies that promote startups is not enough (e.g. Rasmussen at al., 2014). These need to be embraced and reinforced by academic departments "on the ground". Academic departments, themselves, can vary significantly on how eagerly they support university policies on venture creation, as well as how they allocate resources to these. Peer's behavior at the department level has also an influence on faculty's engagement with industry (Tartari et al., 2014).

2.3.3 The academic entrepreneur

The literature adopting an individual lens focuses predominantly on individual antecedents that predict or influence academics' commercial engagement. Factors such as demographic attributes, along with access to material, human and social resources determine the degree and nature of involvement in commercialization efforts.

Career status and seniority have been found to have an influential role. More established and prolific university scientists can afford experimenting with academic entrepreneurship without worrying about tenure, control more resources, and are better positioned to leverage their material and social capital to benefit their commercial efforts (Stephan et al., 2007, Casper and Murray, 2005, Stuart and Ding, 2006). The academics' age and gender have also been described as important predictors with senior male faculty being more likely to engage in commercial activities (Haeussler and Colyvas, 2010). One reason being that the social structure of academia tends to exclude women at an early stage of their careers thus severely affecting their propensity to commercialize their science (Murray and Graham, 2007). Other scholars emphasize the fundamental role of strong and week network ties of faculty members in the creation and growth of new ventures as well as the development of entrepreneurial competencies (Rasmussen and Wright, 2015). The latter is only one example of a wider body of literature adopting a resource-based view on academic entrepreneurship (e.g. Lockett and Wright, 2005, Powers and McDougall, 2005).

Another school of thought argues that that macro level changes (e.g. legislative and institutional) are triggering a modification of university scientists role identity (e.g. Jain et al., 2009; Karhunen, 2016; Fogelberg and Lundqvist, 2013). While some scholars suggest that that faculty entrepreneurs can experience synergy between their roles (Lundqvist and Williams Middleton, 2013), others point to the opposite and argue for the benefits of buffering and separation between the roles (Jain et al., 2009). They maintain that individual academics, who are engaged in commercialization activities, refuse to relinquish their academic role identity and try instead to prioritize, cherish and protect it from the potentially threatening entrepreneurial persona. Such persona represents the prevalent and perpetuated view of the entrepreneur in society as a heroic, passionate and economically driven individual having created and now running his/her own company. While this portrayal reduces entrepreneur's role identity to her individual traits and ignores its relational and embedded nature, it's nevertheless a widely spread depiction that stands in sharp contrast with the image of a "disinterested" academic researcher painted by Merton. Such contrast between the two roles has been used as underlying assumption in a number of existing studies on ´the identity of academic entrepreneurs (e.g. Jain et al., 2009). Identity theory offers therefore an interesting theorical lens for examining the phenomenon of academic entrepreneurship.

2.4 Theories of identity

Identity refers to the meanings that individual's attribute to themselves (Gecas, 1982). The social basis of these meanings has been emphasized in the work of Cooley (1902) and Mead (1934) who both considered the self to be a product of social interaction. Cooley's metaphor of the 'looking glass self' implies the decisive influence of others' views and expectations on who we become and how we define ourselves. This relates to Mead's famous representation of the "I" and "Me" describing the ability of the individual self to become reflexively aware of itself through interaction with others. Over time, a number of identity theories have emerged to explain the social basis of the self, with *social* identity theory (Tajfel & Turner, 1979) and *role* identity theory[2] (Stryker, 1980; Stryker & Burke, 2000) being the most prominent ones. While *social* identity theory (SIT)

[2] I employ the term role identity theory for clarity of writing even though it is usually referred to as identity theory (cf. Stets & Burke, 2000)

is rooted in the psychological part of social psychology, *role* identity theory (RIT) adopts a more sociological approach to identity. Efforts have been made to develop a perspective that brings together insights from both theories into a more unified theory of the self (e.g. Ashforth, 2000; Stets & Burke, 2000). These efforts conceptualize the self-concept as a multifaceted construct comprised of a multitude of identities whose levels of salience vary depending on the individual and the situation (Ashforth, 2000).

Social identity theory proposes that an individual's self-definition is a function of the defining characteristics of the social group one identifies with or belongs to (Hogg, Terry, & White, 1995). A particular social identity reflects membership in valued social groups and puts great importance on in-group cohesion (Tajfel, 1978; Brewer & Gardner, 1996). *Role* identity theory, however, proposes that an individual's self-definition is derived from the roles they occupy in society and the norms and meanings that others associate with those roles (Stets & Burke, 2000; Stryker, 1980). Enacting a particular role depends on the existence of a web of complementary and interdependent roles (Sluss & Ashforth, 2007; Biddle, 2013). For instance, the role of teacher is meaningless without the complementary role of student. As Stryker and Statham note, "To use the term role is necessarily to refer to interaction" (1985: 323).

2.4.1 Identity change

Change in identity has been a recent focus in the literature as it has shifted from conceptualizing identity as stable and enduring to one that is fluid and changing (Gioa et al., 2000; Pratt 2012). Many symbolic interactionists went as far as arguing that identities are formed anew in every situation (Blumer 1969). The latter perspective asserts that a stable identity is an illusion crafted out of individual's 'narrative of the self' (Henkel, 2005). The reason is that conflicting and contradictory identities might constantly pull the individual in different directions rendering the idea of a stable identity a mere illusion (Bauman 1996). Individuals are therefore constantly constructing their sense of who they are as they live through and experience the constantly changing environment in which they are embedded. Identity scholars proposed the notion of identity work (Snow and Anderson, 1987) to explain how individuals transform who they are.

2.4.2 Identity work

Identity work designates *"people's engagement in forming, repairing, maintaining, strengthening, or revising their identities"* (Sveningsson and Alvesson, 2003:1165). The professional identity literature suggests different forms of identity work ranging from mechanisms such as delegation and buffering (Jain et al, 2009), compartmentalization and integration (Shepherd and Haynie, 2009) to cognitive strategies such as searching for optimal balance between identities (Kreiner et al., 2006), experimenting with provisional selves (Ibarra 1999), and using narratives and rhetoric in crafting self-identity (Sveningsson & Alvesson, 2003, Ibarra and Barbulescu, 2010). All these contributions have in common the active agency of individuals in constructing their professional identities while interacting with their social context (Pratt et al., 2006).

When it comes to the identity work of academic entrepreneurs, two main contribution are particularly relevant. On the one hand, Jain et al., (2009) suggested that academic entrepreneurs have an entrenched and usually well-developed academic identity that is more valued than the newly adopted entrepreneurial persona. Therefore, the authors proposed two separation mechanisms (i.e buffering and delegation) that help protect and defend the academic self from entrepreneurial contamination. On the other hand, Karhunen et al. (2017) challenged this view by affirming that in the finish context, academic entrepreneurs viewed their two roles as compatible and complementary to each other and that science-based entrepreneurship is described as an integral part of the research process. However, the authors did not explain, both in terms of concrete practices and more abstract sense-making strategies, how individuals come to develop such an integrative view of the two roles and how that affects the shaping of their work identities.

2.4.3 Work-identity integrity

Professional identity work is depicted as a mechanism for resolving various tensions that emerge when the "being" and the "doing" of professionals are conflicting (Kreiner et al., 2006, Elsbach, 2009). Work-identity integrity becomes then a motivating factor behind professional identity construction. A highly cited study on the identity work of medical residents proposes that when these professionals are faced with a violation between their work and their professional identity, they tend to correct this violation by tailoring their

sense of who they are to match what they do (Pratt et al., 2006). Understanding what professionals do (i.e. practices and work activities) is therefore particularly important for gaining a richer appreciation of their view of who they are. Building on these insights, Lifshitz-Assaf (2018) shows that the divergent reactions of R&D professional whose knowledge work is challenged by the adoption of an open innovation model. The author found that only those who engaged in identity work truly managed to embrace the new model and change their work processes. Others who did not go through identity transformation either actively avoided or openly rejected open innovation. Therefore, in the absence of identity work, there may be no genuine change in how these professionals work. These two examples illustrate the tight bond between the work and identity of professionals, and therefore the necessity to take that into account when studying their identity work.

A change in work roles is usually said to trigger a change in one's professional identity (Nicholson, 1984). In this thesis, and particularly paper I, I examine a particular type of work role transitions, namely what Ashforth et al. (2000) refers to as micro-transitions or the frequent and temporary movements between *simultaneously* held roles. These role changes are to be contrasted with macro-transitions denoting infrequent and often permanent *sequential* changes such retirement for instance. Paper I explores the recurrent micro-transitions experienced by scientists when moving between the roles academic and startup founder.

3. METHODOLOGY

Chapter 2 outlines the methodological choices that underpin this thesis. It starts with study I and II and describes the choices made regarding sampling, data collection and analysis. It also presents the methodological process followed to systematically review the literature in study III before reflecting on ontological and epistemological assumptions and finally discussing validity issues.

3.1 Empirical studies I and II

The ambition of the two empirical studies included in this thesis is to analyze the interplay between concrete work practices and the identity of academic entrepreneurs (**paper I**) as well as to investigate the effect of context on their lived experience (**paper II**).

3.1.1 Sampling

The main source of data was semi-structured interviews (N=46) with faculty members from two universities: Chalmers University of Technology in Sweden and Stanford University in the US (see table 1). The choice of these particular universities as sites of data collection was justified by their historical reputation as fertile environments for creating research-based ventures both on a regional and national level (Jacob et al, 2003; Nelson, 2005). While having different historical and cultural roots, both universities share a strong interest in promoting entrepreneurship among their faculty members. I deliberately selected these two settings to maximize the likelihood of finding participants who are uniquely able to provide rich and relevant input needed for tackling my research goal, namely exploring the lifeworld of academic entrepreneurs and the interplay between their situated work practices and identity. Stanford acts as a comparative 'extreme' case of unity of research and entrepreneurship, both institutionally and culturally (cf. Colyvas and Powell, 2007).

All participants were selected purposively (Palys, 2008) based on whether they had founded a research-based venture while still working in the university. As a result, I could focus on a closely defined group for whom my research questions had a significant meaning. Englander (2012) neatly summarizes my approach by affirming that "when it comes to selecting the subjects for phenomenological research, the question that the

researcher has to ask is: do you have the experience that I am looking for?" instead of "Does the subject belong to the population that I am studying?" Englander (2012:19). The selection of interviewees was not based on statistical grounds but on the relevance of the respondents' experience to the stated research goals.

		POSITION	DEPARTMENT
STANFORD	S1	Professor	Electrical Engineering
	S2	Professor emeritus	Electrical Engineering
	S3	Professor	Electrical Engineering
	S4	Professor	Computer Music
	S5	Professor	Computer Music
	S6	Professor	Computer Music
	S7	Adjunct professor	Computer Music
	S8	Professor	Electrical Engineering and Computer Science
	S9	Professor	Electrical Engineering and Computer Science
	S10	Professor	Electrical Engineering and Computer Science
	S11	Professor	Electrical Engineering and Computer Science
	S12	Professor	Electrical Engineering and Computer Science
	S13	Professor emeritus	Electrical Engineering and Computer Science
	S14	Professor	Law School
	S15	Professor	Medicine - Clinical Pharmacology
	S16	Professor	Bioengineering
	S17	Professor	Bioengineering
	S18	Professor	Bioengineering
	S19	Professor Emeritus	Computer Science
CHALMERS	C1	Professor	Computer Science
	C2	Professor	Computer Science
	C3	Professor	Computer Science
	C4	Assistant professor	Physics
	C5	Postdoc	Computer Science
	C6	Postdoc	Biology and Biological Engineering
	C7	Postdoc	Biology and Biological Engineering
	C8	PhD, lecturer	Energy and Environment
	C9	Associate Professor	Product and Production Development
	C10	Associate Professor	Mechanical Engineering
	C11	Professor	Electrical Engineering

C12	Professor	Electrical Engineering
C13	Associate professor	Electrical Engineering
C14	Professor emeritus	Physics
C15	Professor	Computer Science
C16	Research engineer	Computer Science
C17	Postdoc	Biology and Biological Engineering
C18	Professor	Computer Science
C19	Assistant professor	Computer Science
C20	Professor	Electronics and Communications Engineering
C21	Associate professor	Computer Science and Engineering
C22	Professor	Microtechnology and Nanoscience
C23	Professor	Microtechnology and Nanoscience
C24	Associate professor	Biomedical Engineering
C25	Professor emeritus	Medical Microbiology
C26	Associate professor	Mathematics

Table 1: Interviewees, their academic positions and host departments

Participants' levels of venture creation experience ranged from novices to serial-founders of research-based firms (i.e. more than 2 startups) and their levels of academic experience ranged from post-docs to full professors. Interviewees were active in different research areas in the natural sciences including biotechnology, computer science, electrical engineering and materials science. These fields are often characterized by the abundance of technological inventions that can potentially form the basis of a venture. I made sure to include participants who experienced failure as well success in taking their inventions to market. The main goal was to include a diversified set of academic entrepreneurs with a variety of experiences, as this would generate a richer and more comprehensive data set. The final size of the sample was not predefined and depended mainly on reaching theoretical saturation (Silverman, 2014). Data collection, coding and analysis were conducted simultaneously thus allowing them to inform each other in various ways.

3.1.2 Data Collection

The primary data collection method consisted of intensive, semi-structured, conversations in the phenomenological tradition of inquiry (Berglund, 2015). I first started with a couple of pilot interviews to test and refine the set of themes and questions I plan to cover during the interview. Before each meeting, I searched for publicly available data about both the researchers and their startups using websites, public interviews, blogs and press releases. This input was used to tailor certain questions to the particular participant and enable better contextualization of responses, which helped increase confidence in the trustworthiness of the findings. Interviews lasted between 45 and 90 minutes and were recorded and fully transcribed at the earliest possible time. Using a snowballing technique, I asked participants to recommend other academic entrepreneurs who might have similar experiences (Bryman and Bell, 2014).

Semi structured interviews made it possible to engage in a conversation whereby informants were given ample opportunity to tell their own story and therefore produce richer data. All interviewees were asked a series of open-ended questions that were complemented with follow-up questions that allowed for probing interesting and novel areas or clarifying a statement. Questions addressed issues such as interviewees' background and experiences with founding and building a startup while still on academic duty, their perceived challenges or opportunities when trying to meet the demands of both roles, and finally how they experienced the social feedback generated as a result of their entrepreneurial engagement.

I also collected an extensive list of documents downloaded from the websites of the office of technology licensing (OTL) at Stanford and the Innovation office at Chalmers. The material included university policies on conflict of interests and detailed account of the regulations in place as well as best practices for founding faculty startups. To get a complementary perspective I also interviewed two "innovation officers" at Chalmers as well as the vice head of the committee overseeing the university's strategy on research utilization. These interviews provided an insider account from individuals embedded within the central administration at Chalmers.

3.1.3 Data coding and analysis

I started by thoroughly reading each transcript and dividing it into small meaning units. These are chunks of text that conveyed one particular meaning or idea. Each unit was then assigned a label or a code that captures the essence of the text while staying loyal and close to the wording used by the respondents themselves (Berglund, 2007). During this phase, I had to frequently go back to the recorded conversations in order to recall the atmosphere of the interviews and ensure that my codes reflected accurately what was stated by the respondents. This process generated a very large number of codes that were then clustered into fewer thematically converging groups of codes "second order categories". Some categories contained fewer codes then others and some had to be merged or split as I advanced in the coding process. In some cases, I had to change or add specific questions during my following interviews to probe deeper into a direction that emerged as a result of the coding and analysis process. After several iterations and back and forth movements between data collection, coding and analysis, what looked like an overwhelmingly messy pile of codes in the beginning gradually began converging towards a more stable group of categories that made sense in relation to one another, giving rise to the different themes (Gioia et al, 2013).

3.2 Systematic literature review

Paper III is a systematic review of published work on entrepreneurial identity and the extent to which it has been conceptualized as occupational identity. To do this, the authors combined a systematic search in Scopus with a "snowballing" technique. They began by searching for the keywords "entrepreneurial identity" and "founder identity" in the abstracts, titles and keywords of peer-reviewed journal articles, articles in press and book chapters published up to January 2018. The search led to the identification of 144 documents that formed the review library. The abstracts of all 144 articles were read to eliminate studies where entrepreneurial identity was not the focal construct. Articles that studied team and firm identity were also excluded. 42 articles and book chapters were finally selected and read in full, often several times, by the authors. To complement this list the authors asked colleagues, scrutinized backward and forward citations of selected papers and tried to stay alert to serendipitous discoveries. This strategy helped in

improving the comprehensiveness of the review and allowed the identification of 14 additional relevant documents.

To analyze the results, the authors read all retained articles and book chapters to identify the main conversations in the literature. They noted the key findings of each piece and examined if the concept of entrepreneurial identity was a central or more marginal theme. To address 'centrality' the authors checked if 'entrepreneurial identity' was used in the research questions, contributions and literature reviews of the paper in question. This resulted in selection of 30 pieces of literature that, at least partly, examined the concept of entrepreneurial identity as it relates to work activities and interactions.

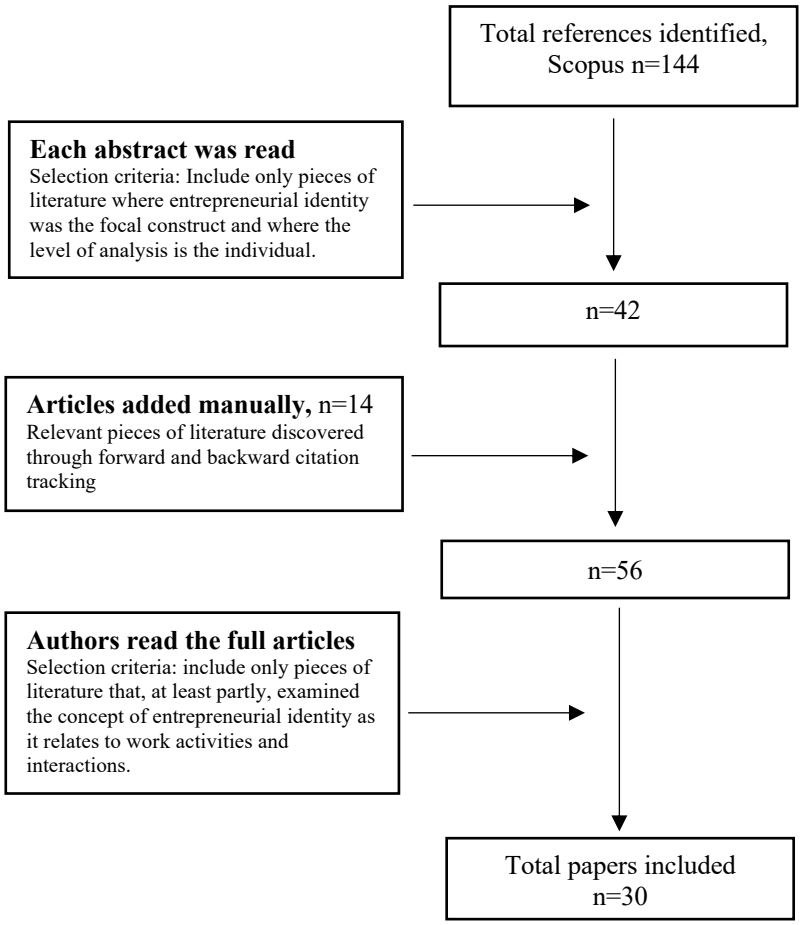

Figure 1: flow chart of selection of relevant literature

3.3 Reflection on underlying assumptions

3.3.1 Epistemic and practical utilities

The aim and the rationality of inquiry in this thesis are defined by both epistemic and practical utilities. On the one hand, exploring the identity work by academic entrepreneurs has a clear *instrumental value*. At a time when many universities are aggressively promoting new initiatives to stimulate academic entrepreneurship, understanding the richness of faculty's experiences and identity work as they combine research and business can inform more appropriate and impactful policy programs. A lack of such understanding can lead to implementation of policies that are ineffective or even counterproductive. On the other hand, advancing knowledge, even if only incrementally, should be central to any doctoral thesis, and the present one is no exception. While the ambition is not to unveil a definite truth about a world that exists out there, particular attention was devoted to the degree of correctness or "truethlikeness" of the findings (Niiniluoto, 1987). This is done through a systematic grounding of theorical claims in comprehensive and in-depth qualitative interview data. Unlike realist theories of scientific progress that consider truth to be an important goal of inquiry (and perhaps its main epistemic utility), the present thesis is focused, instead, on bolstering "evidential justification" as a key epistemic utility (Nola and Sankey, 2014).

3.3.2 Epistemology

From an epistemological point of view, the position adopted here is that the world cannot be known independently of human interpretation. Making sense of how academic entrepreneurs, themselves, make sense of their lived experiences and identity cannot be neutral, at least not according to the realist epistemological ideal of objectivity. It seems nearly impossible to totally subdue or bracket one's preconceptions, interests and reflections when engaging with and interpreting the data. The only way is to accept and embrace the unavoidable influence of one's "theory-laden" perceptions and focus instead on explicitly and transparently presenting the chain of evidence that forms the basis of theoretical claims and conclusions. It would be misleading though, perhaps even naive, to claim that all theoretical statements advanced in this thesis are completely explicable by what's going on in the world (i.e. the phenomenon studied). The issue of theorical under-determination (Quine, 1951) warrants a humbler attitude towards the possibility of

a one-to-one correspondence between the phenomenon under study and the theoretical claims derived from it.

Another virtue of focusing on transparently displaying the chain of evidence and how it relates to resulting theorical insights is that it allows for a community-driven process of critical examination and review by knowledgeable peers. This means that the burden of objectivity is shared by both the individual researcher and the broader scientific community, which is also in line with Longino's (1990) argument about the social character of science.

3.3.3 Ontology

From an ontological perspective, this thesis subscribes to the view that individuals are embedded in socially constructed meaning systems that influence their identities and what they deem as appropriate behaviors. Identities are neither stable nor innate. They continuously develop and emerge over time as individuals construct them in their everyday interactions and talk. Giddens elegantly captured the fluid and inherently shifting character of identity by depicting it as a "process of becoming". Building on this, my focus on the lived experience of academic entrepreneurs aims at elucidating the richness and complexity of their realities and the ambiguities they have to grapple with. It's rather meaning and subjective understanding that are at the heart of this thesis and not the ability to capture essential features of the human condition. I tend to believe that it is overwhelmingly difficult, if not impossible, to generate law-like generalizations when studying the social world. I am not entirely sure one can ever capture the complexities of human behavior in laws that are broadly applicable and therefore reflect some robust regularities. My position is therefore in line with Popper's argument that the social world is an open-ended system with a constant stream of inputs and where variables cannot be stabilized and studied ceteris paribus like it's usually the case in the natural sciences.

3.4 Limitations and validity

Two main validity threats are usually associated with qualitative research; the researcher's bias or subjectivity when interpreting the results and the researcher's influence on the setting and respondent's answers (Maxwell, 2013). Complete elimination of the actual influence of the researcher or her bias is quite impossible. My focus instead was on understanding how I am influencing the results and in what way this can threaten the conclusions that I draw from the data. The constant dialogue with my supervisor and other friendly reviewers helped *limit* the influence of my preconceptions and biases when interpreting the data. However, possible alternative explanations remain surely one of the main weaknesses of this thesis.

I collected detailed and "rich" data through in-depth interviews that were often fully transcribed soon after the interview took place. I tried to combine this with post-interview respondent validation to rule out the possibility of misinterpreting the meaning of interviewee's statement. It should be mentioned though that this validation was not conducted systematically after each interview. I used it mainly when in doubt about statements that were not clearly understandable from either the interview transcript or my own personal notes.

Interviews come with an inherent self-report bias that decreases the validity of the results. In order to limit the effects of such validity threat, I collected data from a diverse set of individuals including innovation officers and administrators to complement the insight that interviews yielded (Flick, 2014). I also engaged in careful reading of secondary data sources to get a better understanding of the context in which my study subjects operated.

If I could reverse the course of time and revisit my research design, I would have chosen to conduct an in-depth ethnographic study that relies on a combination of both phenomenological interviews and non-participant observations. It would have allowed me to better capture how academic entrepreneurs not only talk about but also perform their identity. As Van Maanen (2010) would argue, in matters of identification, actions often speak louder than words. Identity formation is not merely a rhetorical process that

could be fully captured though interviews, but a performance that relies on both verbal and non-verbal cues. Additionally, the fact that identity formation is a process that unfolds over time as individuals engage in their everyday activities points to another inherent limitation in this thesis: the lack of longitudinal data tracking the evolution of how identity and practice co-evolve and influence each other overtime. Independently of the empirical setting, future research could generate valuable insights by adopting a longitudinal design when investigating the interplay between practice, identity, and context.

4. SUMMARIES OF APPENDED PAPERS

This section presents summaries of the appended papers. The summaries provide a brief overview of the research question, method, findings and contribution.

4.1 Paper I

Title: Constructing a Hybrid Identity: The Case Of Academic Entrepreneurs

This paper examines how academic entrepreneurs construct their work identities as they repeatedly transition between ostensibly distinct work roles: academic and entrepreneur. Findings are based on 26 in- depth phenomenological interviews with academic entrepreneurs, i.e. academics who start companies to commercialize their research while remaining with the university. The study context is Chalmers University of Technology in Sweden. The paper first highlights the role tensions experienced by these individual. These tensions stem essentially from the difference in the general character and approach to work as well as the character of artifacts that are developed in the two domains. When reflecting on their identities, the respondents clearly disidentified with established roles of typical entrepreneur and traditional academic. They chose instead to describe themselves as "innovators", "problem solvers" or even "brave academics". Doing so allowed them to claim an identity that transcendence any given role and that is firmly anchored in concrete work practices.

The paper also introduces three work-related mechanisms— role demarcating, role cross-fertilizing, and role normalizing—that respondents used to hybridize their work identity. These mechanisms contain a mix of defensive tactics aimed at demarcating the roles, and more proactive and synergy seeking tactics that seek to weave the roles together. Role demarcating describes how academic and entrepreneurial roles are managed by sharp separation of certain role elements. Role cross-fertilizing highlights the ways in which combining academic and entrepreneurial roles generates opportunities for synergy. Finally, role normalizing depicts how academic entrepreneurship is seen as appropriate in light of broader discourses surrounding the modern academic.

This paper contributes to the literature on academic entrepreneurship by extending and nuancing the work of Jain et al. (2009) who noted how academic entrepreneurs tended to protect, prioritize and cherish their core academic identity at the expense of their entrepreneurial identity. The paper shows instead that both identities were indeed cherished and enacted in a way that allowed harnessing cross-fertilization effects between their distinct work activities. The findings are in line with Nicholson (1984) by confirming that high levels of autonomy and discretion in both roles allow for identity and work to coevolve and shape each other. Lastly, this study illustrates how practices and work activities can be central for understanding how individuals make sense of their multiple identities at work.

4.2 Paper II

Title: The Lived Experience of Academic Entrepreneurship: A Comparative Case Study of Chalmers and Stanford.

This paper focuses on how academic entrepreneurs' institutional context affects how they experience and practically manage the combination of research and business. By taking the experiences of individual academics as point of departure, this study provides a complement to the overwhelming majority of research on academic entrepreneurship that is mainly focused on macrolevel explanation. The paper is based on a comparative case study between Stanford University and Chalmers University of Technology. Both universities support entrepreneurship among faculty but differ in the degree to which this practice has become institutionalized. At Stanford science commercialization is embraced as an appropriate activity for faculty. Well-understood routines and enforceable policies have been developed overtime to govern the comingling of science and business. At Chalmers, the rules governing science commercialization are still vague and occasionally contested. The appropriateness of business activity by faculty is not yet widely accepted which signals a lower degree of institutionalization if compared with Stanford.

The empirical material consists of transcripts from 46 in-depth, semi-structured, interviews with faculty from both Stanford and Chalmers. The content of the conversations centered around the participants' personal experiences from engaging in founding a startup to commercialize their research results. The paper is also based on secondary data including among other things, an extensive list of documents on university policies regarding conflict of interests, best practices for faculty startups as well as reports, and coaching tools used by innovation officers in their interaction with prospective faculty entrepreneurs.

The findings show that in a context where the practice of research commercialization is under-institutionalized, faculty entrepreneurs' resort to ad-hoc measures to cope with contextual ambiguities. They privilege silencing their entrepreneurial engagements and fall back on the public good to rationalize their entrepreneurial pursuits. In contrast, in a context where research commercialization is institutionalized, faculty entrepreneurs praise the virtues of conforming to the institutional script. Instead of silencing, they have no problem exposing and discussing their business enterprise with experienced colleagues. They tend to invoke the specific good of the industry and fall back on paradigmatic cases of commercialization to motivate their entrepreneurial pursuits.

4.3 Paper III

Title: 'What I Do Defines Me': Exploring Entrepreneurship as Occupational Identity

While 'who is the entrepreneur?' might be the wrong question, the field of entrepreneurship is increasingly interested in understanding how individuals answer the question 'who am I' when engaging in entrepreneurial activity. This paper explores to the extent to which entrepreneurship has been conceptualized as an occupational identity in existing literature. It is based on a comprehensive review of the fragmented literature on entrepreneurial identity, while building from literature on occupational identity, to explore individual identification based on 'what I do'.

The review process started by using searching for "entrepreneurial identity" and "founder identity" in abstracts, titles and keywords of peer-reviewed journal articles, articles in press and book chapters. No predefined starting date was set to allow for a more comprehensive review of the literature. 144 relevant documents were identified. After careful reading 30 articles and book chapters were deemed eligible and formed the basis of the review.

The literature review revealed a number of ways that scholars conceptualized entrepreneurial identity. The paper distinguishes between four bases of conceptualization: work role, career, social group and discourse-based conceptualizations. The findings highlight how current conceptualizations of entrepreneurial identity suggest that being "entrepreneur" is not yet fully perceived as an occupational identity. Most studies addressing the transition to entrepreneurship from other occupations note the intertwined nature of previously held occupational identities with the newly developing entrepreneurial identity. An entrepreneurial identity is formulated as occupational in nature only when infused with meanings grounded in some other professional expertise.

4.4 Paper IV

Title: Opportunities as Artifacts and Entrepreneurship as Design.

The opportunity concept has been subject to intense debates in the entrepreneurship literature. While agreeing that opportunities constitute profitable market imperfections, some scholars treat them as antecedents to entrepreneurial action which, in turn, aims at discovering profit opportunities that exist independently of the individual. Other scholars treat them as outcomes of entrepreneurial action. This means that entrepreneurs themselves provoke market deficiencies that can subsequently be turned into profit. While these conceptualizations are useful for understanding what happened retrospectively after an entrepreneur has achieved success, they do not allow for improving our understanding of entrepreneurial action leading up to that very same

success. Such conceptualizations also prove to be hard to empirically operationalize and provide limited help for practicing entrepreneurs.

This paper provides an alternative approach that is anchored in Herbert Simon's view of design. It conceptualizes entrepreneurship as a form of design and develops experimentation and transformation as its ideal types. It also elaborates on opportunities as artifacts that iteratively develop at the interface between organized individuals and their environment. By bringing concrete and material artifacts into the analysis, and by delineating principles of entrepreneurial design, this paper gives managerial relevance and analytically clarifies the idea that entrepreneurship is about action under uncertainty.

5. DISCUSSION

By taking practical work activities as point of departure this thesis explores how academic entrepreneurs experience and practically manage the combination of research and business. This chapter emphasizes the interplay between *practice and identity* by demonstrating how practice can inform, in fundamental ways, the construction of a work identity.

5.1 Practice as an occasion for nuancing work identity

This thesis argues that during times of professional change (i.e. change in roles, work activities and their associated meanings), identity work is fundamentally grounded in practical experience. This is in in line with findings from the identity literature showing that professionals derive meaning essentially from what they do, and as a consequence often seek an authentic relationship between their work and their overarching view of themselves as professionals (Pratt at al., 2006; Caza et al., 2016; Wrzesniewski and Dutton, 2001; Lifshitz-Assaf, 2018). Individuals who can revise their own identity to express the work they do or vice versa are more likely to persist when faced with a challenging transformation in roles or work practices (Nicholson,1987).

In this thesis, and based on the findings from **paper I**, this thesis argues that by personally enacting the role of company founder and immersing themselves in the concrete everyday practices of startup work, academic entrepreneurs are provided an occasion to nuance their work identities and to discover what aspects of both the old and the new jobs are more expressive of who they are as professionals. They often describe coming across and getting surprised by unexpected associations between academic and entrepreneurial work. These associations would likely have gone unnoticed had these individuals not practically engaged in building and developing a company. The concrete and practical nature of the work they do in the startup and its concomitance with academic work, provides an opportunity to reevaluate and extend their existing academic identity. These practices can question deeply held convictions about what they enjoy and find meaningful to do. For instance, a professor and founder of a MedTech company described how direct and real encounters with medical doctors exposed him to genuine and real-life stories about patients whose lives could potentially be saved thanks to his invention. The

realness and authenticity of these encounters challenged what he considered to be worthwhile doing as an academic scholar. Science for its own sake was not enough anymore:

> *"Before this stage, when I was a pure academic, I could do a project just because it's fun. I was working on chaos theory and things like that and it was lots of fun. After a while I realized I can't really just go to work and have fun. For some people that was enough, but for me it was not enough… when you go to the hospital and you see the patient and you talk to the medical doctors and they describe the problems they are having… we are talking about real people's lives in those situations. This is motivating for me as a scientist and as a businessman" C11*

By taking practical work as point of departure, this thesis additionally sheds light on how most respondents, including those from Stanford, use selective identification across traditional role boundaries. Instead of embracing either role as self-defining, they resisted describing themselves as one or the other and chose instead to speak of an overarching identity that is anchored in concrete work activities from both domains: academia and entrepreneurship. This observation echoes similar findings in the professional identity literature that describe how primary care residents deepened and nuanced their understanding of their professional identity as a result of direct contact with real patients and life and death type decisions (Pratt et al, 2006). The identity hybridization discussed in this thesis also connects to findings on how organizations reconcile their multiple identities (e.g. Pratt and Forman, 2000). One proposed mechanism is aggregation defined as retaining all identities while forging links between them. In this sense, aggregation aims at maximizing plurality and synergy instead of buffering and separation between identities.

5.2 Shifting the identification target: from role to its constitutive practices

In the academic entrepreneurship literature, academic identity is usually portrayed in terms of the Mertonian norms (Merton 1968) that university researchers internalize to the

point that they become "inextricably intertwined with their role identity" (Jain et al. 2009: 924). In contrast, entrepreneurship is usually depicted using opposite norms such as secrecy, uniqueness, passion and over-optimism— (e.g. Jain et al. 2009, O'Kane 2015, cf. Mitroff 1974), thus suggesting that entrepreneurial pursuits directly conflict with the conventional academic identity. This view conceptualizes academic and entrepreneurial roles as complete gestalts that are essentially different with little or no overlap, and by the same token overlooks the intra-role heterogeneity and complexity that **paper I** reveals. Academic entrepreneurs were for instance shown to differentiate between a wide range of practices that they associated with both roles, and instead of a wholesale identification with one role or the other, they selectively related with certain work activities and distanced themselves from others.

In other words, respondents shifted the target of identification from the role, as a unitary entity, to its constitutive activities and practices. To illustrate, they were just as glad to delegate management and sales in the startup as they were to delegate everyday lab work and exam grading at the university. Similarly, outlining the strategic roadmap of the startup was deemed just as meaningful to their identities as was exploring and solving cutting-edge research problems. This thesis argues that there is clearly a more subtle and intricate relationship between the two roles than can be understood by viewing them as two holistic and essentially dissimilar gestalts. The frequent transitions between the activities that constitute the two roles lead to selective identification with certain activities and disidentification with others. In this case, identity was derived from engaging in a web of concrete practices and substantive work content (cf. van Maanen & Schein 1977, Barley & Kunda, 2001) rather than from a distinct role or social category. Given that an increasing number of individuals occupy multiple work roles simultaneously for parts of their careers, it's not unreasonable to contend that selective identification may also be vital for making sense of how these other professionals reconcile and hybridize their work identity.

5.3 Role demarcation as an enabler of role cross-fertilization

Respondents underscored the importance of role demarcation when combining academic research with entrepreneurial activities. To do so, Stanford faculty emphasized

conforming and strictly abiding by the university's rules and policies. In contrast, Chalmers faculty had to establish themselves material and symbolic boundaries to prevent their roles from interfering with each other (paper II). At the same time, all these respondents provided rich accounts of how their roles, and the work activities involved in them, mutually enhanced each other. These accounts depicted a seemingly puzzling picture that combines both role demarcation and cross-fertilization. While the first implies erecting boundaries, the second conveys their dismantling. This thesis argues that talk about separation is often justified by external considerations grounded in other's views and perceptions, while talk about cross-fertilization is often grounded in individual's personal views and perceptions. For instance, this Chalmers professor emphasized the discrepancy between his perceived role and the one his colleagues at the department are possibly attributing to him:

> *"For me it's very clear that 99% of the time I have a Chalmers hat but I noticed that when I sit, for instance, in executive groups at the department and we debate and I present my view on something, the others might think I talk from my startup's perspective. I often realize that after when I analyze how discussions go on. People are, of course, always suspicious. I don't know how to deal with that. Maybe one can be a clearer saying this is the Chalmers me who speaks but that would be kind of silly." C22*

To influence what kind of role gets ascribed to him by other faculty members, this particular respondent opted for a clear separation between his work in the university and his startup activities. For instance, he was physically moving to another office whenever working on startup related assignments. Such clear signaling of role demarcation can be interpreted as an attempt to regain control over how others perceived and understood his role. In this case, demarcation was less of a response to the incommensurability of his academic and entrepreneurial roles, and more of an attempt to fend off suspicious reactions from colleagues. This way, he could continue working on his startup while seeking the role synergies he spent the rest of the interview describing. In other words, demarcating the roles of academic and entrepreneur enabled their subsequent cross-

feralization. In a context like Chalmers where the everyday practices and expectations surrounding science commercialization are still steeped in ambiguity, academic entrepreneur's lived experiences were often punctuated by the need to explicitly and intentionally demarcate their roles in order to signal transparency and integrity to their colleagues. An experience that none of the Stanford professors had to live through as long as they conformed to the well-understood and accepted regulations in place.

5.4 Identity and epistemic priorities

While **paper IV** conceptually highlights the central role of material artifacts in the practice of entrepreneurship, **paper I** builds on empirical evidence to show how academic entrepreneurs experience and engage with different types of artifacts and approaches to work. In a university research setting, the ultimate artifact is often a scientific publication. In the startup, it's a reliable and useable product. While a publication can be based on a rough prototype or a proof of concept, a customer, however, usually expects technically polished solutions that cater to a very particular need. Respondents reported that scientific research requires meticulous and careful work to answer "why" questions and explore underlying mechanisms as illustrated by this respondent:

> *"I think research is very much abstract, so you have to abstract from real problems to really see the bare bones of the scientific question, try to simplify it as much as possible. In the real world you need to use methods that are rather non publishable so to say." C2*

Product engineering and design require, however, abstracting away from why a particular artifact works the way it does and focusing entirely on making it work in a reliable way. The aims of the action in the two processes are thus quite different. In research, the aim is to change in "the realm of the mind" by obtaining knowledge about an existing world. In the startup instead, the aim is to bring about a change in the "realm of the external material world" (Eekels and Roozenburg, 1991:198). These differing epistemic priorities are illustrated by this respondents from Chalmers:

"In research, if you know how to do a thing to a certain level that proves that everything is working, that's it. You don't need to make sure that it's waterproof or that it will work forever. However, in the startup, you actually spend much more time on refining it. In research, when I know that something works, I publish. Refining what I published is company work." C4

In both domains, everyday practice is related in one way or another to the pursuit of knowledge whether through academic or entrepreneurial work. The nature of this knowledge and its instantiation in concrete artifacts differed between the two domains. In the research domain, the artifact (e.g. software code, prototype) was described as being intermediary in nature and serves the sole purpose of proving that an abstract model or theory developed in the mind of the scientist works as predicted and therefore can be published. In the startup, however, the artifact is subject to an essentially different set of very practical constraints that have to do with the end user. This difference is illustrated in how one respondent compared the difference between these two types of artifacts.

"One difference is that in the company we have a product and not just a prototype. A research prototype software is useable only by the person who wrote it. You make it work well enough to get the results that you need for publication, but if you are putting something in the hands of a customer then it needs to work much better than that. You have to work very hard on usability, especially to make things as simple as possible to use so that people will be very familiar with it and can use it effectively." C1

Engaging practically in developing both types of artifacts, sometimes simultaneously, allowed respondents to question and revisit their beliefs, attitudes and values regarding how to develop, justify, and use knowledge. The work done in the startup, though having a different epistemic priority, was seen as a natural extension to the epistemic work they were used to in their academic research. In return, practical but technologically challenging problems faced at the startup often formed the impetus of

future research directions. This interplay between university research and technological problem solving in the company allowed respondent to think of themselves as having a hybrid identity which is, in the words of a Stanford professor, "deeper that any individual hat I wear" (S19).

These observations connect to previous research on academic entrepreneurs who view their two roles as integrated (Karhunen et al., 2017). This thesis extends this work by highlighting the interplay between the knowledge work conducted in the company and at the university. These findings also suggest that academic entrepreneurs' hybrid identity is grounded in beliefs, attitudes and values regarding the pursuit of knowledge rather than in the inclusion in a social group or occupational role. Emphasizing the epistemic dimension allows for novel analyses of identity and identity work that are increasingly relevant in an era marked by knowledge-intensive work and growing demands for industry-academy partnerships. It seems that the 'moral imperative' of knowledge development is sustained by academic entrepreneurs, as they get involved in both entrepreneurial tasks and traditional academic duties. Instead of maintaining distance to an essentially different entrepreneurial identity (cf. Jain et al. 2009), a new epistemic identity appears to be formed that manages to incorporate both new and old activities. And in this process, knowledge development and utilization appear to be central integrative principles.

6. CONCLUSIONS AND SUGGESTIONS

This thesis explored how academic entrepreneurs experience and practically manage the combination of academic and entrepreneurial work, with special emphasis on the interplay between *practice and identity* and the effects of *institutional context*. The purpose was to deepen and complement our understanding of academic entrepreneurship by taking as point of departure the *lived experience* of university scientists engaged in venture creation.

6.1 Conceptual contributions

The thesis extends the literature on academic entrepreneurship by explaining how academic entrepreneurs bring into alignment their daily practice and work identity. **Paper I** suggests that academic entrepreneurs do not seek to protect their academic identities and delegate entrepreneurial work wholesale. Instead specific aspects of both roles were valued and seemed essential to their sense of work identity. It proposes three work-related mechanisms through which our respondents hybridized their work identity: *Role demarcating* describes how faculty entrepreneurs *selectively* separated certain aspects of their roles, thus shifting the target of identification from the role to its components. *Role cross-fertilizing* highlights the different ways synergetic effects were pursued when simultaneously enacting academic and entrepreneurial roles. Finally, *role normalizing* describes how entrepreneurial pursuits were perceived as appropriate by latching onto broader discourses regarding the modern academic. The thesis also highlights how role demarcation and role cross-fertilization are not mutually exclusive. On the contrary, demarcation can be an enabler of cross-fertilization.

The thesis also contributes to the literature on role-transitions and identity. It highlights the central role that concrete work activities play in the identity work of faculty who transition frequently between their different roles. Theses back-and-forth movements between the entrepreneurial and academic spheres allow researchers to discover unforeseen connections at the level of concrete and mundane everyday work activities. Practice (i.e. doing things) provides therefore an occasion for discovering meaning and realizing what is really expressive of who they are and want to be as professionals.

The thesis (**paper II**) also contributes to the literature on the role of context in science commercialization. It illustrates the value of conceptualizing academic entrepreneurship as an institutionally embedded practice through the lens of "the actor in the social world whose doing and feeling lies at the bottom of the whole system" (Schütz, 1964, p. 7). **Paper II** shows that in a context where the practice of research commercialization is under-institutionalized, academic entrepreneurs cope with contextual ambiguity in an improvised and idiosyncratic fashion. They privilege silencing their entrepreneurial engagements and appeal to the general societal value of science commercialization. In contrast, in a context where academic entrepreneurship is institutionalized, faculty tend to assiduously conform to standard and scripted operating procedures and have no issue publicly discussing their startups with colleagues. Instead of contributions to the common good, they often highlight what the industry stands to gain from their research, and often refer to paradigmatic cases of commercialization to motivate their entrepreneurial pursuits.

In addition to these conceptual contributions, the thesis has a number of implications for institutional actors (e.g. policy makers, university administrators, public funding agencies) seeking to design policies that are attuned to the life worlds and the practical realities of academic entrepreneurs.

6.2 Implications for policy

It is essential for policy makers to be cognizant of the fact that academic entrepreneurship requires not just a formal and rigid separation between roles, but also the ability of individual scientists to nurture mutually reinforcing effects between their various work roles. This thesis shows that the cross-fertilization between concrete work practices can actually be extremely useful as academic entrepreneurs construct a hybrid identity that includes both academic and entrepreneurial components. Therefore, emphasizing the constructive interplay at the level of practice during training and coaching programs targeted towards academic entrepreneurs can be very valuable.

If there is something that most academics interviewed in this research agreed on, it would be the importance of being personally involved in the commercialization effort, especially during the early stages of company development. It's a responsibility that most of them consider too important to fully delegate to an external stakeholder. The intricacy and complexity of the technologies produced in the lab and the scientific knowledge that lies implicit in them require the active and direct involvement of the scientist, not just as the technical expert, but also as a decision maker who gets to shape the strategic positioning of the company, it's emerging culture and its relationship with its environment (e.g. Customers, investors and key partners). Policy makers and university administrators may therefore stand to gain from facilitating the multifaceted role that university scientists can play during the early but crucial stages of company building.

While support infrastructure and a positive attitude from management are important elements, they need to be complemented by significant work on the culture inside the university and the different departments. Change in culture requires, among other things, clarifying and clearly communicating basic rules of conduct that would level the playing field for everybody in the organization. In the absence of taken for granted guidelines on conflict of interest and role boundaries, academic entrepreneurs face the double burden of dealing with suspicion and rumors among colleagues in addition to overcoming the challenges inherent to commercializing science. A change in culture also requires the celebration of successful cases that can serve as role models for individual scientists. Cases like these can particularly help in legitimizing the practice of science commercialization within the university.

6.3 Suggestions for future research

This thesis has made several claims about how practice, identity and context influence each other in the case of science commercialization. Nonetheless, the ability to draw more general conclusions that are relevant to the boarder community of management and organizational studies may rest on the use of a more comprehensive mixed method approach combining both qualitative and quantitative methods.

Additionally, individual faculty members are embedded in a nested structure that includes the research group, the department, the university and the "invisible college" of colleagues within the same scientific discipline. Each of these layers often imply differing support level, normative expectations and taken for granted practices and therefore may differently affect the lived experience and identity work of academic entrepreneurs. Disentangling the dynamics that tie identity work to each of these nested institutional layers would be a fruitful avenue of future research.

Similarly, further studies are warranted to investigate the grounding of identity in concrete work practices that transcend role boundaries and the effect of epistemic priorities on this process in terms of how knowledge should be produced, validated, and utilized. The goal would be to build a theory for identity formation that can explain how work identities can combine and hybridize when straddling roles that are characterized by knowledge production.

Finally, I join my voice to that of Fini et al. (2019) to argue that science commercialization could form a viable empirical base for studying issues of more general interest to management scholars. The lived experience of academic entrepreneurship and what it entails in terms of managing the intricate and identity shaping transition across professional domains can be ideal for studying the details of organizational processes unfolding over time (Langley et al., 2013) and across institutional boundaries (Colyvas and Powell, 2006).

7. REFERENCES

Aldridge, T.T. and Audretsch, D., 2011. The Bayh-Dole act and scientist entrepreneurship. Research policy, 40(8), pp.1058-1067.

Ashforth, B. E., Kreiner, G. E., & Fugate, M. (2000). All in a day's work: Boundaries and micro role transitions. *Academy of Management review*, *25*(3), 472-491.

Ashforth, B. E., & Johnson, S. A. (2001). Which hat to wear. *Social identity processes in organizational contexts*, 32-48.

Baker, T., & Nelson, R. 2005. Creating something from nothing: Resource construction through entrepreneurial Bricolage. Administrative Science Quarterly, 50: 329–366.

Balven, R., Fenters, V., Siegel, D. S., & Waldman, D. (2018). Academic entrepreneurship: The roles of identity, motivation, championing, education, work-life balance, and organizational justice. Academy of Management Perspectives, 32(1), 21-42.

Barley, S. R., & Kunda, G. (2001). Bringing work back in. *Organization science*, *12*(1), 76-95.

Bauman, Z. (1996). 'From pilgrim to tourist – or a short history of identity' in Hall, S. and du Gay, P. (eds.), Questions Of Cultural Identity. London: Sage, pp. 18–36.

Berglund, H. (2007). Researching entrepreneurship as lived experience. *Handbook of qualitative research methods in entrepreneurship*, *3*, 75-93.

Berglund, H. (2015). Between Cognition and Discourse: Phenomenology and the Study of Entrepreneurship. International Journal of Entrepreneurial Behavior & Research. Special Issue: Embracing Qualitative Research Philosophies and Methods. 21(3): 472-288.

Biddle, B. J. (2013). *Role theory: Expectations, identities, and behaviors*. Academic Press.

Blumer, H. (1986). Symbolic interactionism: Perspective and method. Univ of California Press.

Bryman, A. and Bell, E., 2014. Business research methods. Oxford University Press, USA.

Brewer, M. B., Gardner, W. (1996). Who is this "we"? Levels of collective identity and self-representations. Journal of Personality and Social Psychology, 71(1), 83–93.

Brewer, M. B. (2001). The many faces of social identity: Implications for political psychology. Political psychology, 22(1), 115-125.

Brown, A. D. (2015). Identities and identity work in organizations. *International Journal of Management Reviews*, *17*(1), 20-40.

Caldera, A., & Debande, O. (2010). Performance of Spanish universities in technology transfer: An empirical analysis. Research policy, 39(9), 1160-1173.

Casper, S., & Murray, F. (2005). Careers and clusters: analyzing the career network dynamic of biotechnology clusters. Journal of Engineering and Technology Management, 22(1-2), 51-74.

Caza, B.B., & Creary, S.J. (2016). The construction of professional identity. In A. Wilkinson, D. Hislop and C. Coupland (Eds). *Perspectives on contemporary professional work*, Elgar

Clark, B. R. (1998). Creating entrepreneurial universities: Organizational pathways of transformation. Issues in higher education. Elsevier Science Regional Sales, 665 Avenue of the Americas, New York.

Clarysse, B., Tartari, V. and Salter, A., 2011. The impact of entrepreneurial capacity, experience and organizational support on academic entrepreneurship. Research Policy, 40(8), pp.1084-1093.

Colyvas, J. A., & Powell, W. W. (2007). From vulnerable to venerated: The institutionalization of academic entrepreneurship in the life sciences. In The sociology of entrepreneurship (pp. 219-259). Emerald Group Publishing Limited.

Cooley, C. H. (1992). *Human nature and the social order*. Transaction Publishers.

Dimov, D. (2016). Toward a design science of entrepreneurship. In Models of start-up thinking and action: theoretical, empirical and pedagogical approaches (pp. 1-31). Emerald Group Publishing Limited.

Di Gregorio, D., & Shane, S. (2003). Why do some universities generate more start-ups than others?. Research policy, 32(2), 209-227.

Eekels, J., & Roozenburg, N. F. (1991). A methodological comparison of the structures of scientific research and engineering design: their similarities and differences. Design studies, 12(4), 197-203.

Elsbach, K. D. (2009). Identity affirmation through signature style': A study of toy car designers. Human Relations, 62(7), 1041-1072.

Englander, M. (2012). The interview: Data collection in descriptive phenomenological human scientific research. Journal of phenomenological psychology, 43(1), 13-35.

Etzkowitz, H., & Leydesdorff, L. (1999). The future location of research and technology transfer. The Journal of Technology Transfer, 24(2-3), 111-123.

Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university–industry–government relations. Research policy, 29(2), 109-123.

Etzkowitz, H., Webster, A., Gebhardt, C. and Terra, B.R.C., 2000. The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm. Research policy, 29(2), pp.313-330.

Etzkowitz, H. (2003). Research groups as 'quasi-firms': the invention of the entrepreneurial university. Research policy, 32(1), 109-121.

Fini, R., Rasmussen, E., Wiklund, J., & Wright, M. (2019). Theories from the lab: how research on science commercialization can contribute to management studies. *Journal of Management Studies*, *56*(5), 865-894.

Flick, U. (2014): An Introduction to Qualitative Research, 5th edition, Sage, London, UK.
Fogelberg, H., & Lundqvist, M. A. (2013). Integration of academic and entrepreneurial roles: The case of nanotechnology research at Chalmers University of Technology. *Science and Public Policy*, *40*(1), 127-139.

Galán-Muros, V., van der Sijde, P., Groenewegen, P., & Baaken, T. (2017). Nurture over nature: How do European universities support their collaboration with business?. The Journal of Technology Transfer, 42(1), 184-205.

Geuna, A., & Nesta, L. J. (2006). University patenting and its effects on academic research: The emerging European evidence. Research policy, 35(6), 790-807.

Gecas, V. 1982. The self-concept. ***Annual Review of Sociology***, 8, 1-33, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. and Trow, M., 1994. The new production of knowledge: The dynamics of science and research in contemporary societies. Sage.

Gibbons, M. (Ed.). (1994). The new production of knowledge: The dynamics of science and research in contemporary societies. Sage.

Gioia, D. A., Schultz, M., Corley, K. G. 2000 "Organizational identity, image, and adaptive instability." Academy of Management Review, 25: 63–81.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. Organizational research methods, 16(1), 15-31.

Glenna, L. L., Lacy, W. B., Welsh, R., & Biscotti, D. (2007). University administrators, agricultural biotechnology, and academic capitalism: Defining the public good to promote university–industry relationships. The Sociological Quarterly, 48(1), 141-163.

Grimaldi, R., Kenney, M., Siegel, D.S. and Wright, M., 2011. 30 years after Bayh–Dole: Reassessing academic entrepreneurship. Research Policy, 40(8), pp.1045-1057.

Gruber, M., & MacMillan, I. C. (2017). Entrepreneurial behavior: A reconceptualization and extension based on identity theory. *Strategic Entrepreneurship Journal*, *11*(3), 271-286.

Guerrero, M., Urbano, D., Fayolle, A., Klofsten, M., & Mian, S. (2016). Entrepreneurial universities: emerging models in the new social and economic landscape. Small Business Economics, 47(3), 551-563.

Haeussler, C., & Colyvas, J. A. (2011). Breaking the ivory tower: Academic entrepreneurship in the life sciences in UK and Germany. Research Policy, 40(1), 41-54.

Henkel, Mary (2005) 'Academic Identity and Autonomy in a Changing Policy', Higher Education 49: 155–76.

Hessels L.K. and van Lente H. (2008). Re-thinking new knowledge production: A literature review and a research agenda, Research Policy 37 740.760

Hogg, M. A., Terry, D. J., & White, K. M. (1995). A tale of two theories: A critical comparison of identity theory with social identity theory. *Social psychology quarterly*, 255-269.

Hoye, K. and Pries, F., (2009). 'Repeat commercializers,'the 'habitual entrepreneurs' of university–industry technology transfer. Technovation, 29(10), pp.682-689.

Huberman, M., & Miles, M. B. (2002). The qualitative researcher's companion. Sage.

Ibarra, H. and Barbulescu, R., 2010. Identity as narrative: Prevalence, effectiveness, and consequences of narrative identity work in macro work role transitions. Academy of Management Review, 35(1), pp.135-154.

Jacob, M., Lundqvist, M., & Hellsmark, H. (2003). Entrepreneurial transformations in the Swedish University system: the case of Chalmers University of Technology. *Research Policy*, *32*(9), 1555-1568.

Jain, S., George, G., & Maltarich, M. (2009). Academics or entrepreneurs? Investigating role identity modification of university scientists involved in commercialization activity. *Research policy*, *38*(6), 922-935.

Karhunen, P., Olimpieva, I. & Hytti, U., 2017. Identity work of science-based entrepreneurs in Finland and in Russia. Entrepreneurship & Regional Development, 29(5-6), pp.544- 566.

Kenney, M., & Patton, D. (2009). Reconsidering the Bayh-Dole Act and the current university invention ownership model. Research Policy, 38(9), 1407-1422.

Kirzner IM. 1973. Competition and Entrepreneurship. University of Chicago Press: Chicago.

Kleinman, D. L. (2003). Impure cultures: University biology and the world of commerce. Univ of Wisconsin Press.

Klofsten, M., & Jones-Evans, D. (2000). Comparing academic entrepreneurship in Europe–the case of Sweden and Ireland. *Small Business Economics*, 14(4), 299-309.

Klofsten, M., Fayolle, A., Guerrero, M., Mian, S., Urbano, D., & Wright, M. (2019). The entrepreneurial university as driver for economic growth and social change-Key strategic challenges. Technological Forecasting and Social Change, 141, 149-158.

Knight FH. 1921. Risk, Uncertainty, and Profit. August M. Kelley: New York.

Lach, S., & Schankerman, M. (2008). Incentives and invention in universities. The RAND Journal of Economics, 39(2), 403-433.

Lam A (2010) From 'ivory tower traditionalists' to 'entrepreneurial scientists'? Academic scientists in fuzzy university-industry boundaries. Soc Stud Sci 40(2):307–340

Lam, A., and de Campos, A. (2015). 'Content to be sad' or 'runaway apprentice'? The psychological contract and career agency of young scientists in the entrepreneurial university. Human Relations, 68(5), 811-841.

Lifshitz-Assaf, H. (2018). Dismantling knowledge boundaries at NASA: The critical role of professional identity in open innovation. Administrative science quarterly, 63(4), 746-782.

Litan, R. E., Mitchell, L., & Reedy, E. J. (2007). The university as innovator: Bumps in the road. Issues in Science and Technology, 23(4), 57-66.

Lockett, A., & Wright, M. (2005). Resources, capabilities, risk capital and the creation of university spin-out companies. Research policy, 34(7), 1043-1057.

Longino, H.E. (1990). Science as social knowledge (chapter 4). Princeton, NJ:
Princeton University Press

Lundqvist, M. A., & Middleton, K. L. W. (2013). Academic entrepreneurship revisited–university scientists and venture creation. *Journal of Small Business and Enterprise Development*.

Markman, G. D., Gianiodis, P. T., Phan, P. H., & Balkin, D. B. (2005). Innovation speed: Transferring university technology to market. *Research Policy*, *34*(7), 1058-1075.

Markus, H., & Kunda, Z. (1986). Stability and malleability of the self-concept. *Journal of personality and social psychology*, *51*(4), 858.

Martin, B. R. (2012). Are universities and university research under threat? Towards an evolutionary model of university speciation. Cambridge journal of economics, 36(3), 543-565.

Mathias, B. D., & Williams, D. W. (2017). The impact of role identities on entrepreneurs' evaluation and selection of opportunities. *Journal of Management*, *43*(3), 892-918.

Maxwell, J. A. (2013). "Qualitative research design". Sage, London.

Mead, G. H. (1934). *Mind, self and society* (Vol. 111). University of Chicago Press.: Chicago.

Merton, R. K. (1957). Priorities in scientific discovery: a chapter in the sociology of science. American sociological review, 22(6), 635-659.

Mitroff, I. (1974). Norms and Counter-norms in a Select Group of the Apollo Moon Scientists: A Case Study of the Ambivalence of Scientists. American Sociological Review 39: 579–95.

Mowery, D. C., & Sampat, B. N. (2005). The Bayh-Dole Act of 1980 and university–industry technology transfer: a model for other OECD governments?. The Journal of Technology Transfer, 30(1-2), 115-127.

Murray, F., & Graham, L. (2007). Buying science and selling science: gender differences in the market for commercial science. Industrial and Corporate Change, 16(4), 657-689.

Mustar, P., & Wright, M. (2010). Convergence or path dependency in policies to foster the creation of university spin-off firms? A comparison of France and the United Kingdom. The Journal of Technology Transfer, 35(1), 42-65.

Muscio, A., Quaglione, D., & Ramaciotti, L. (2016). The effects of university rules on spinoff creation: The case of academia in Italy. Research Policy, 45(7), 1386-1396.

Muscio, A., Quaglione, D., & Vallanti, G. (2014). University regulation and university–industry interaction: a performance analysis of Italian academic departments. Industrial and Corporate Change, 24(5), 1047-1079.

Nelson, R. R. (2004). The market economy, and the scientific commons. Research policy, 33(3), 455-471.

Nelson, A. J. (2005). Cacophony or harmony? Multivocal logics and technology licensing by the Stanford University Department of Music. Industrial and Corporate Change, 14(1), 93-118.pp. 922-935.

Nicholson, N. (1984). A theory of work role transitions. *Administrative science quarterly*, 172-191.

Niiniluoto, I., (1987). Truthlikeness, Dordrecht: D. Reidel.

Nola, R & Sankey, H. (2014). Theories of scientific method: An Introduction
(chapter 2). New York: Routledge.

Nowotny, H., Scott, P., & Gibbons, M. (2003). Introduction:'Mode 2'revisited: The new production of knowledge. Minerva, 41(3), 179-194.

O'Kane, C., Mangematin, V., Geoghegan, W., and Fitzgerald, C. (2015). University technology transfer offices: The search for identity to build legitimacy. Research Policy, 44(2), 421-437.

Palys, T. (2008). Purposive sampling. The Sage encyclopedia of qualitative research methods, 2(1), 697-8.

Parker, S. C. (2004). The economics of self-employment and entrepreneurship. Cambridge university press. Chicago

Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D'Este, P., ... & Krabel, S. (2013). Academic engagement and commercialisation: A review of the literature on university–industry relations. Research policy, 42(2), 423-442.

Perkmann, M., Salandra, R., Tartari, V., McKelvey, M., & Hughes, A. (2019). Academic engagement: A review of the literature 2011-2019. Available at SSRN 3461621.
Chicago

Phan, P. H., & Siegel, D. S. (2006). The effectiveness of university technology transfer. Foundations and Trends® in Entrepreneurship, 2(2), 77-144.

Pilegaard, M., Moroz, P.W. and Neergaard, H., 2010. An auto-ethnographic perspective on academic entrepreneurship: Implications for research in the social sciences and humanities. The Academy of Management Perspectives, 24(1), pp.46-61.

Powell, W. W., Owen-Smith, J., & Colyvas, J. A. (2007). Innovaton and emulation: Lessons from American universities in selling private rights to public knowledge. Minerva, 45(2), 121-142.

Powers, J. B., & McDougall, P. P. (2005). University start-up formation and technology licensing with firms that go public: a resource-based view of academic entrepreneurship. Journal of business venturing, 20(3), 291-311.
Chicago

Pratt, M. G. 2012 "Rethinking identity construction processes in organizations: Three questions to consider." In Schultz, M., Maguire, S., Langley, A., Tsoukas, H. (eds.), Perspectives on Process Organization Studies: Constructing Identity In and Around Organizations: 21–49. London: Oxford University Press.

Pratt, M. G., & Foreman, P. O. (2000). Classifying managerial responses to multiple organizational identities. *Academy of Management Review*, *25*(1), 18-42.

Pratt, M. G., Rockmann, K. W., & Kaufmann, J. B. (2006). Constructing professional identity: The role of work and identity learning cycles in the customization of identity among medical residents. *Academy of management journal*, *49*(2), 235-262.

Quine, W. V. O., 1951, "Two Dogmas of Empiricism", Reprinted in From a Logical Point of View, 2nd Ed., Cambridge, MA: Harvard University Press

Rasmussen, E., & Wright, M. (2015). How can universities facilitate academic spin-offs? An entrepreneurial competency perspective. The Journal of Technology Transfer, 40(5), 782-799.

Rasmussen, E., & Borch, O. J. (2010). University capabilities in facilitating entrepreneurship: A longitudinal study of spin-off ventures at mid-range universities. Research policy, 39(5), 602-612.

Rasmussen, E., Mosey, S., & Wright, M. (2014). The influence of university departments on the evolution of entrepreneurial competencies in spin-off ventures. Research policy, 43(1), 92-106.

Romme, G. (2016). The quest for professionalism: The case of management and entrepreneurship. Oxford University Press.

Rothaermel, F.T., Agung, S.D., Jiang, L. (2007). University Entrepreneurship: A Taxonomy of the Literature. Industrial and Corporate Change 16(4), 691*791.

Sarasvathy, S. D. (2004). The questions we ask and the questions we care about: reformulating some problems in entrepreneurship research. Journal of Business Venturing, 19(5), 707-717.

Sarasvathy, S. (2008). Effectuation: Elements of entrepreneurial expertise. Edward Elgar Publishing.

Schulte, P. (2004). The entrepreneurial university: a strategy for institutional development. Higher education in Europe, 29(2), 187-191.Slaughter, S., & Rhoades, G. (2004). *Academic capitalism and the new economy: Markets, state, and higher education*. JHU Press.

Schumpeter JA. 1911. The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle (1934 edn). Harvard University Press: Cambridge, MA.

Schumpeter, Joseph A. (1942). Capitalism, Socialism and Democracy. New York: Harper and Row.

Schütz, A. (1964), "Collected Papers", in Brodersen, A (Ed.), Studies in Social Theory, Vol. II, Martinus Nijhoff, The Hague.

Shane, S. A. (2004). Academic entrepreneurship: University spinoffs and wealth creation. Edward Elgar Publishing.

Siegel, D. S., Waldman, D., & Link, A. (2003). Assessing the impact of organizational practices on the relative productivity of university technology transfer offices: an exploratory study. Research policy, 32(1), 27-48.

Siegel, D.S. and Wright, M., 2015. University technology transfer offices, licensing, and start-ups. Chicago handbook of university technology transfer and academic entrepreneurship, pp.1-40.

Siegel, D. S., & Wright, M. (2015). Academic entrepreneurship: time for a rethink?. British Journal of Management, 26(4), 582-595.

Slaughter, S., & Leslie, L. L. (1997). Academic capitalism: Politics, policies, and the entrepreneurial university. The Johns Hopkins University Press, 2715 North Charles Street, Baltimore, MD 21218-4319.

Slaughter, S., & Rhoades, G. (2004). Academic capitalism and the new economy: Markets, state, and higher education. JHU Press.

Sluss, D. M., Ashforth, B. E. (2007). Relational identity and identification: Defining ourselves through work relationships. Academy of Management Review, 32(1), 9–32.

Silverman, D. (2014). "Interpreting qualitative data". Sage, London.

Snow, D. A., & Anderson, L. (1987). Identity work among the homeless: The verbal construction and avowal of personal identities. American journal of sociology, 92(6), 1336-1371.

Stephan, P. E., Gurmu, S., Sumell, A. J., & Black, G. (2007). Who's patenting in the university? Evidence from the survey of doctorate recipients. Econ. Innov. New Techn., 16(2), 71-99.

Stets, J. E., & Burke, P. J. (2000). Identity theory and social identity theory. *Social psychology quarterly*, 224-237.

Stryker, S. (1980). *Symbolic interactionism: A social structural version*. Benjamin-Cummings Publishing Company.

Stryker, S., & Statham, A. (1985). Symbolic interaction and role theory. In G. Lindzey & E. Aronson (Eds.), Handbook of social psychology (3rd ed.), vol. 1: 311-378. New York: Random House.

Stryker, S., & Burke, P. J. (2000). The past, present, and future of an identity theory. *Social psychology quarterly*, 284-297.

Stuart, T. E., & Ding, W. W. (2006). When do scientists become entrepreneurs? The social structural antecedents of commercial activity in the academic life sciences. American journal of sociology, 112(1), 97-144.

Sveningsson, S., & Alvesson, M. (2003). Managing managerial identities: Organizational fragmentation, discourse and identity struggle. Human relations, 56(10), 1163-1193.

Tajfel, H. (1978). Differentation between social groups: Studies in the social psychology of intergroup relations, London.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. *The social psychology of intergroup relations*, *33*(47), 74.

Tartari, V., Perkmann, M., & Salter, A. (2014). In good company: The influence of peers on industry engagement by academic scientists. Research Policy, 43(7), 1189-1203. Chicago

The economist, 2005. The Bayh-Dole act's 25th birthday (December 20)

Van Looy, B., Landoni, P., Callaert, J., Van Pottelsberghe, B., Sapsalis, E., & Debackere, K. (2011). Entrepreneurial effectiveness of European universities: An empirical assessment of antecedents and trade-offs. Research Policy, 40(4), 553-564.
Van Maanen, J. and E. H. Schein (1979). Toward of Theory of Organizational Socialization.

Research in Organizational Behavior, 1: 209-264

Van Maanen, J. (2010). Identity work and control in occupational communities. Cambridge University Press.

Van Maanen, J., Soerensen, J. B. and Mitchell, T. R. (2007): "The interplay between theory and method", Academy of Management Review, Vol. 32, No. 4, pp. 1145-1154.

Venkataraman, S., Sarasvathy, S. D., Dew, N., & Forster, W. R. (2012). Reflections on the 2010 AMR decade award: Whither the promise? Moving forward with entrepreneurship as a science of the artificial. Academy of Management Review, 37(1), 21-33.

Wright, M. (2014). Academic entrepreneurship, technology transfer and society: where next?. The journal of technology transfer, 39(3), 322-334.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. Academy of management review, 26(2), 179-201.

Yencken, J., & Ralston, L. (2005). Evaluation of incentives for commercialisation of research in Australian universities. Prepared by Karingal Consultants, Department of Educations, Science and Training.